

AMENDMENT UNDER 37 C.F.R. § 1.116
APPLICATION NO. 09/437,246
ATTORNEY DOCKET NO. Q56708

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 4, 8, 9, 26, 28, 33, 35, 45, 48, 49, and 52 are canceled.

The claims are amended as follows:

10. (Amended three times) An ink cartridge as set forth in any one of claims 1 [, 4,] or 5, wherein said valve device comprises:

a valve member selectively contacting with a surface of said packing member, said valve member being forced by the ink supply needle of the printing apparatus when the ink cartridge is mounted on the printing apparatus; and
an elastic member always urging said valve member toward said packing member.

18. (Amended) [An ink cartridge as set forth in claim 9,] An ink cartridge for a printing apparatus providing ink to a print head through an ink supply needle and removably attached to the print head, comprising:

an ink chamber for containing ink;

an ink supply port for supplying ink from said ink chamber to the print head of the printing apparatus, said ink supply port comprising an external opening;

a packing member provided in said ink supply port, forming an ink channel for allowing a flow of ink, said packing member sealing the ink supply needle of the printing apparatus by fitting therewith; and

a valve device contained in said ink supply port elastically abutting against said packing member, said valve device selectively opening and closing said ink channel in conjunction with the ink supply needle, said valve device comprising:

AMENDMENT UNDER 37 C.F.R. § 1.116
APPLICATION NO. 09/437,246
ATTORNEY DOCKET NO. Q56708

a valve body contacting with said packing member and urged by the ink supply needle of the printing apparatus to open said ink channel when the ink cartridge is mounted on the printing apparatus; and
a guide body for guiding said valve body to slide substantially vertically with respect to said packing member, and operably suppressing a horizontal deviation of said valve device;

wherein said valve body comprises:

a sealing portion for closing said ink channel of said packing member when said valve device contacts with said packing member; and
an ink channel allowing ink to pass therethrough when said valve body is urged to come out of contact with said packing member by the ink supply needle of the printing apparatus.

24. (Amended) [An ink cartridge as set forth in claim 9,] An ink cartridge for a printing apparatus providing ink to a print head through an ink supply needle and removably attached to the print head, comprising:

an ink chamber for containing ink;
an ink supply port for supplying ink from said ink chamber to the print head of the printing apparatus, said ink supply port comprising an external opening;
a packing member provided in said ink supply port, forming an ink channel for allowing a flow of ink, said packing member sealing the ink supply needle of the printing apparatus by fitting therewith; and
a valve device contained in said ink supply port elastically abutting against said packing member, said valve device selectively opening and closing said ink channel in conjunction with the ink supply needle, said valve device comprising:

AMENDMENT UNDER 37 C.F.R. § 1.116
APPLICATION NO. 09/437,246
ATTORNEY DOCKET NO. Q56708

a valve body contacting with said packing member and urged by the ink supply needle of the printing apparatus to open said ink channel when the ink cartridge is mounted on the printing apparatus; and
a guide body for guiding said valve body to slide substantially vertically with respect to said packing member, and operably suppressing a horizontal deviation of said valve device;

wherein said valve body and said guide body are separately formed and fixed to each other by fixing means.

25. (Amended) [An ink cartridge as set forth in claim 9,] An ink cartridge for a printing apparatus providing ink to a print head through an ink supply needle and removably attached to the print head, comprising:

an ink chamber for containing ink;

an ink supply port for supplying ink from said ink chamber to the print head of the printing apparatus, said ink supply port comprising an external opening;

a packing member provided in said ink supply port, forming an ink channel for allowing a flow of ink, said packing member sealing the ink supply needle of the printing apparatus by fitting therewith; and

a valve device contained in said ink supply port elastically abutting against said packing member, said valve device selectively opening and closing said ink channel in conjunction with the ink supply needle, said valve device comprising:

a valve body contacting with said packing member and urged by the ink supply needle of the printing apparatus to open said ink channel when the ink cartridge is mounted on the printing apparatus; and

a guide body for guiding said valve body to slide substantially vertically with respect to said packing member, and operably suppressing a horizontal deviation of said valve device;

AMENDMENT UNDER 37 C.F.R. § 1.116
APPLICATION NO. 09/437,246
ATTORNEY DOCKET NO. Q56708

wherein said valve body and said guide body are formed as one unit with each other.

34. (Amended) [An ink cartridge as set forth in claim 33,] An ink cartridge for a printing apparatus providing ink to a print head through an ink supply needle and removably attached to the print head, comprising:

an ink chamber for containing ink;

an ink supply port for supplying ink from said ink chamber to the print head of the printing apparatus, said ink supply port comprising an external opening;

a packing member provided in said ink supply port, forming an ink channel for allowing a flow of ink, said packing member sealing the ink supply needle of the printing apparatus by fitting therewith; and

a valve device contained in said ink supply port elastically abutting against said packing member, said valve device selectively opening and closing said ink channel in conjunction with the ink supply needle, said valve device comprising a valve body contacting with said packing member and comprising a substantially flat surface with which the ink supply needle contacts;

wherein:

said valve body of said valve device comprises a surface formed with a spherical surface contacting with said packing member, and

said spherical surface of said valve device has a diameter of curvature larger than a diameter of the widest part of said valve body.

36. (Amended two times) An ink cartridge as set forth in [any one of claims 8 or] claim 11, wherein said valve body of said valve device comprises a surface formed with a spherical surface contacting with said packing member, and wherein said spherical surface of said valve device is formed with a flat portion with which the ink supply needle contacts.

AMENDMENT UNDER 37 C.F.R. § 1.116
APPLICATION NO. 09/437,246
ATTORNEY DOCKET NO. Q56708

37. (Amended three times) An ink cartridge as set forth in any one of claims 1 [, 4,] or 5, wherein said valve device comprises:

- a valve body contacting with said packing member and urged by the ink supply needle of the printing apparatus to open said ink channel when the ink cartridge is mounted on the printing apparatus; and
- an elastic support portion for supporting said valve body.

38. (Amended three times) An ink cartridge as set forth in any one of claims 1 [, 4,] or 5, [8, or 9,] further comprising a packing retainer for retaining said packing member at said external opening of said ink supply port.

50. (Amended two times) A printing apparatus as set forth in any one of claims 1 [, 4,] or 5, [8, and 9,] wherein said ink supply port includes a concave portion, and wherein said packing member includes a protruding portion extending toward said supply port and fitting with the concave portion of said ink supply port.

51. (Amended) An ink cartridge for a printing apparatus providing ink to a print head through a tapered ink supply needle, said ink cartridge capable of providing ink to the print head through the ink supply needle, the ink cartridge comprising:

- an ink chamber containing ink therein and an absorbent material;
- an ink channel for providing ink from said ink chamber to the print head of the printing apparatus;
- a first member provided at said ink channel, forming a part of said ink channel for allowing a flow of ink, said first member sealing the ink supply needle of the ink printing apparatus by fitting therewith; and
- a second member contained in said ink channel elastically abutting against said first member in a direction which is the same as a direction of the sealing by said first member with said

AMENDMENT UNDER 37 C.F.R. § 1.116
APPLICATION NO. 09/437,246
ATTORNEY DOCKET NO. Q56708

second member, said second member selectively opening and closing said ink channel in conjunction with the ink supply needle;

wherein a direction of said ink channel, from the ink port to the ink chamber having the absorbent material, is substantially the same direction of the sealing by said first member with said second member.

54. (Amended) An ink cartridge for a printing apparatus providing ink to a print head through an ink supply needle and removably attached to the print head, comprising:

an ink chamber for containing ink;

an ink supply port for supplying from said ink chamber to the print head of the printing apparatus, said ink supply port comprising an external opening;

a packing member provided in said ink supply port, forming an ink channel for allowing a flow of ink, said packing member sealing the ink supply needle of the printing apparatus by fitting therewith; and

a valve device contained in said ink supply port elastically abutting against said packing member, said valve device selectively opening and closing said ink channel in conjunction with the ink supply needle, said valve device being urged by the ink supply needle of the printing apparatus to open said ink channel [() , at substantially [at a] the same time, ()] when the ink supply needle is sealed by said packing member;

wherein:

a distance from a part of said valve device which first contacts [to] the ink supply needle when the needle inserts into said ink supply port to a part of said packing member which engages with the ink supply needle is longer than a distance between a tip end of the ink supply needle and a part of the ink supply needle which first contacts [to] the packing member when the ink cartridge is coupled to the printing apparatus, and said packing member has a surface slanting at a certain angle substantially the same as a tapered angle of the ink supply needle, said slanting surface of said packing member

AMENDMENT UNDER 37 C.F.R. § 1.116
APPLICATION NO. 09/437,246
ATTORNEY DOCKET NO. Q56708

being disposed in the vicinity of where said packing member contacts said valve device.

Claims 55-61 are added as new claims.

FAX RECEIVED
DEC 23 2002
TECHNOLOGY CENTER 2800